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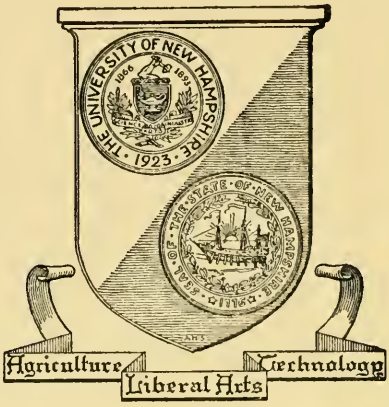

The University
of
New Hampshire

Bulletin 343 October, 1942

THE UNIVERSITY OF NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION
Department of Agricultural and Biological
Chemistry

Inspection of Commercial Fertilizers for 1942

Made for the

STATE DEPARTMENT OF AGRICULTURE

T. O. SMITH and H. A. DAVIS

THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Andrew L. Felker, Commissioner of Agriculture. The state inspector, Mr. Harry West, collected samples of 84 brands of fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1942. The general character of the brands sampled is shown by the following classification:

Complete fertilizer	58
Phosphoric acid and potash	2
Superphosphate	8
Sulphate of ammonia	1
Nitrate of soda	1
Cyanamid	1
Muriate of potash	3
Ground bone	5
Natural manures	5

The Fertilizer Law

The purchaser of a fertilizer should familiarize himself with the full text of the fertilizer law. He should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in compliance with the law. The law governing these matters is as follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package; the name, brand or trademark under which the fertilizer is sold; the name and address of the manufacturer or importer; the location of the factory; and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

The state official charged with the enforcement of the fertilizer law is the Commissioner of Agriculture. Copies of the full text of the law may be obtained from his office in Concord. All inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which would doubtless soon appear on the market if the sale of fertilized was not under state regulation. The value of a fertilizer depends mainly upon its

content of available plant food, particularly nitrogen, phosphoric acid, and potash. The presence of these constituents can only be determined by a chemical analysis. To insure that they are being furnished by all manufacturers in the guaranteed amounts, it is considered necessary that each brand of fertilizer offered for sale be officially inspected and analyzed one or more times each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law in every respect will not only assist in the enforcement of the law but will at the same time insure himself the protection of the law. If the buyer fails to assure himself the legal requirements have been met, he accepts the fertilizer at his own risk.

All samples reported in this bulletin were drawn by an inspector appointed by the Commissioner of Agriculture. The chemical analyses were made by the methods of the Association of Official Agricultural Chemists.

Conformity to Guarantee

Fifty-four of the 84 brands analyzed equaled or exceeded the manufacturer's guarantee. No brand failed to meet the guarantee in all of the three constituents, total nitrogen, available phosphoric acid, and water-soluble potash. Five brands were below guarantee in two of the three constituents, four in nitrogen and available phosphoric acid, and one in nitrogen and potash. Thirty brands failed to meet the guarantee in only one constituent.

Including all the brands referred to above, 15 brands were found to contain less than the guaranteed amount of nitrogen. The greatest deficiency was 0.46 per cent. The average of the other 14 deficiencies was 0.17 per cent. Eleven brands failed to meet the guarantee in availabl phosphoric acid. One brand was deficient 3.59 per cent. The average of the other 10 deficiencies was 0.64 per cent. One sample of ground bone was deficient 0.25 per cent in total phosphoric acid. Eight brands contained less potash than was guaranteed. The greatest deficiency was 3.61 per cent. The average of the other 7 deficiencies was 0.45 per cent.

Six brands were guaranteed to contain magnesium oxide. All fully met the guarantee.

In the tabulation of the analyses in the following pages deficiencies of one-fourth of one per cent or more are shown in bold-face type. The manufacturers are arranged alphabetically. The brand name is listed alphabetically or numerically by formula under the manufacturer.

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Agricultural Chemical Co. North Weymouth, Mass.										
AA 3-10- 4 Corn Favorite	3.00	3.16	.....	10.37	10.00	**9.48**	4.00	4.71	.....	.....
AA 4- 8- 4 Market Garden Fertilizer	4.00	4.13	.....	8.86	8.00	8.02	4.00	4.42	.....	.....
AA 4- 8-10 Potato and Root Crop Fertilizer	4.00	4.16	.....	12.61	8.00	11.83	10.00	**6.39**	.....	.....
AA 7- 7- 7 Top Dresser	7.00	6.81	.....	8.32	7.00	7.27	7.00	8.21	.....	.....
AA 8-16-14 Double Strength Fertilizer	8.00	8.02	.....	16.94	16.00	16.52	14.00	14.01	.....	.....
AA 16 per cent Superphosphate	.....	.....	.....	16.96	16.00	16.26	.....	.....	.....	.....
Agrico 3-10- 6 for Corn	3.00	3.23	.....	11.03	10.00	10.49	6.00	6.51	.....	.....
Agrico 4- 8-10 for New England	4.00	4.03	.....	8.73	8.00	8.19	10.00	**8.80**	.....	.....
Agrico 4-12- 6 for Corn	4.00	3.90	.....	9.16	12.00	**8.41**	6.00	9.32	.....	.....
Agrico 5- 8- 7 for Potatoes and Vegetables	5.00	5.02	.....	9.08	8.00	8.31	7.00	7.00	.....	.....
Agrico 5- 8-10 for Aroostook with 10 per cent Potash	5.00	**4.66**	.....	8.80	8.00	8.06	10.00	10.76	.....	.....
Agrico 7- 7- 7 for Top Dressing	7.00	**6.67**	.....	8.62	7.00	7.78	7.00	7.87	.....	.....
Agrico 7-12-14 for Aroostook Multiple Strength	7.00	6.84	.....	12.95	12.00	12.39	14.00	**13.72**	.....	.....
Agrico 8- 6- 2 Country Club Fertilizer	8.00	7.78	.....	6.94	6.00	6.46	2.00	2.45	.....	.....
Agrico 8- 6- 4 Country Club Fertilizer	8.00	**7.75**	.....	7.15	6.00	6.60	4.00	4.32	.....	.....
Fine Ground Bone	2.47	2.90	23.00	23.05	.....	13.83	.....	.....	.....	.....
18 per cent Normal Superphosphate	.....	.....	.....	19.29	18.00	18.55	.....	.....	.....	.....
Pulverized Sheep and Goat Manure	1.25	1.58	1.00	1.51	.....	1.41	2.00	2.65	.....	.....
American Cyanamid Co. Niagara Falls, Canada										
Aero Cyanamid Granular	20.60	20.68	.....	.....	.....	.....	.....	.....	.....	.....
Apothecaries Hall Co. Waterbury, Conn.										
Bone Meal	2.25	2.27	22.00	29.75	.....	18.49	.....	.....	.....	.....
Liberty High Grade Market Gardeners 5-8-7	5.00	5.14	.....	8.56	8.00	8.26	7.00	7.11	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Armour Fertilizer Works Carteret, N. J.										
Armour's Big Crop 4- 8-10	4.00	3.88	.....	8.44	8.00	8.00	10.00	10.00	.....	.....
Armour's Big Crop 5- 8- 7 Fertilizer	5.00	5.02	.....	8.62	8.00	8.15	7.00	7.15	.....	.....
Armour's Big Crop 5-10-10 Fertilizer	5.00	5.07	.....	10.68	10.00	10.17	10.00	10.00	.....	.....
Armour's Big Crop 8-16-20	8.00	8.08	.....	16.68	16.00	16.33	20.00	20.12	.....	.....
Berkshire Chemical Co. Bridgeport, Conn.										
Berkshire 4- 8- 4 Fertilizer	4.00	3.88	.....	8.16	8.00	7.80	4.00	4.35	.....	.....
Berkshire 4- 8-10 Fertilizer	4.00	4.01	.....	7.97	8.00	**7.59**	10.00	10.39	.....	.....
Berkshire 5- 8- 7 Fertilizer	5.00	5.01	.....	8.01	8.00	**7.75**	7.00	7.69	.....	.....
Berkshire 7- 7- 7 Fertilizer	7.00	7.02	.....	7.57	7.00	7.31	7.00	7.22	.....	.....
Berkshire 8-16-14 Fertilizer	8.00	**7.63**	.....	15.20	16.00	**14.96**	14.00	14.02	.....	.....
Chilean Nitrate Sales Corp. New York, N. Y.										
Champion Brand Chilean Nitrate of Soda	16.00	16.05	.....	.....	.....	.....	.....	.....	.....	.....
Consolidated Rendering Co. Boston, Mass.										
Corenco 3-10- 4 Animal Brand	3.00	3.05	.....	10.45	10.00	10.17	4.00	4.40	.....	.....
Corenco 4- 8- 4 Corn and Vegetable	4.00	4.00	.....	9.03	8.00	8.51	4.00	4.34	.....	.....
Corenco 4- 8-10 Potato Grower	4.00	4.12	.....	8.97	8.00	8.43	10.00	10.15	.....	.....
Corenco 5- 8- 7 General Crop Manure	5.00	5.10	.....	9.23	8.00	8.83	7.00	6.89	.....	.....
Corenco 7- 7- 7 Complete Fruit and Top Dressing	7.00	6.87	.....	8.01	7.00	7.55	7.00	7.30	.....	.....
Corenco 8-16-14 Two in One Fertilizer	8.00	7.90	.....	16.74	16.00	16.54	14.00	15.64	.....	.....
Corenco Ground Bone	2.47	2.64	23.00	**22.75**	.....	13.82	.....	.....	.....	.....
Corenco Muriate of Potash	.....	.....	.....	.....	.....	.....	60.00	60.91	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Consolidated Rendering Co. Boston, Mass. (Continued)										
Corenco Sheep Manure	1.25	1.80	1.00	1.08	.....	1.02	2.00	3.19	.....	.....
Corenco Sulphate of Ammonia	20.50	20.74	.....	.....	.....	.....	.....	.....	.....	.....
Corenco Superphosphate 16 per cent	.....	.....	.....	18.68	16.00	17.20	.....	.....	.....	.....
Corenco Superphosphate 20 per cent	.....	.....	.....	20.60	20.00	20.10	.....	.....	.....	.....
Eastern States Farmers' Exchange Springfield, Mass.										
Eastern States 0-20-20 Open Formula Fertilizer	.....	.....	.....	18.88	20.00	**18.41**	20.00	22.29	.....	.....
Eastern States 5-10-10 Open Formula Fertilizer	5.00	5.26	.....	11.23	10.00	10.73	10.00	10.04	1.00	2.14
Eastern States 7- 7- 7 Open Formula Fertilizer	7.00	7.18	.....	7.83	7.00	7.63	7.00	7.27	2.00	3.15
Eastern States 8-16-16 Open Formula Fertilizer	8.00	8.01	.....	17.02	16.00	16.60	16.00	16.16	0.50	2.03
Eastern States 8-24- 8 Open Formula Fertilizer	8.00	8.07	.....	24.57	24.00	24.33	8.00	8.51	.....	.....
Eastern States Ground Steamed Bone	2.30	2.90	23.00	25.90	.....	15.74	.....	.....	.....	.....
Eastern States 20 per cent Superphosphate Granular	.....	.....	20.50	21.45	20.00	20.79	.....	.....	.....	.....
Eastern States Triple Superphosphate	.....	.....	.....	46.41	47.00	**46.07**	.....	.....	.....	.....
Muriate of Potash	.....	.....	.....	.....	.....	.....	60.00	62.15	.....	.....
International Minerals & Chemical Co. Woburn, Mass.										
Caribee Green and Fairway Fertilizer	7.00	7.01	.....	5.54	5.00	5.14	3.00	3.63	.....	.....
Caribee 5-10-10 Market Garden Fertilizer	5.00	5.07	.....	10.96	10.00	10.56	10.00	10.26	2.00	3.33
International 0-14-14 Fertilizer	.....	.....	.....	15.23	14.00	14.38	14.00	14.01	.....	.....
International 4- 8- 4 Fertilizer	4.00	4.03	.....	8.77	8.00	8.36	4.00	4.03	.....	.....
International 4- 8-10 Fertilizer	4.00	4.04	.....	8.97	8.00	8.37	10.00	10.00	.....	.....
International 5- 8- 7 Fertilizer	5.00	4.89	.....	8.72	8.00	8.28	7.00	7.00	.....	.....
International 5- 8-10 Fertilizer	5.00	5.00	.....	8.74	8.00	8.29	10.00	10.06	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
International Minerals & Chemical Co. Woburn, Mass. (Continued)										
International 6-12-12 Fertilizer	6.00	6.02	.....	12.66	12.00	12.10	12.00	12.54	2.00	2.61
International 7- 7- 7 Fertilizer	7.00	6.84	.....	8.23	7.00	7.69	7.00	7.01	.....	.....
International 8-16-14 Fertilizer	8.00	**7.54**	.....	15.53	16.00	**15.17**	14.00	14.11	2.00	2.46
International Caribee Sheep Manure	1.25	2.13	.....	1.22	0.75	1.10	2.00	3.66	.....	.....
International Muriate of Potash	.....	.....	.....	.....	.....	.....	60.00	60.60	.....	.....
International 16 per cent Superphosphate	.....	.....	.....	17.74	16.00	16.44	.....	.....	.....	.....
International 20 per cent Superphosphate	.....	.....	.....	20.20	20.00	**19.70**	.....	.....	.....	.....
Alfred Ledoux Manchester, N. H.										
Sheep Fertilizer	1.53	1.56	0.26	0.36	0.20	0.26	3.00	2.95	.....	.....
Mechling Bros. Chemicals Camden, N. J.										
Mechling's Veget-Aid 5-10-5	5.00	5.02	.....	11.93	10.00	11.43	5.00	5.42	.....	.....
Merrimack Farmers' Exchange Concord, N. H.										
Merrimack Brand 4- 8-10	4.00	4.01	.....	8.72	8.00	8.40	10.00	9.81	.....	.....
Merrimack Brand 4-12- 4	4.00	4.05	.....	12.56	12.00	12.09	4.00	4.22	.....	.....
Merrimack Brand 5- 8- 7	5.00	5.03	.....	9.50	8.00	8.72	7.00	**6.51**	.....	.....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Rogers & Hubbard Co. Portland, Conn.										
Hubbard's Corn and Grain Fertilizer 3-10-4	3.00	3.17	.....	10.54	10.00	**9.62**	4.00	4.43	.....	.....
Hubbard's Domestic Sheep Manure	1.50	1.75	.....	1.34	1.00	1.02	1.50	2.04	.....	.....
Hubbard's Golf Course Fertilizer 8-6-2	8.00	8.01	.....	6.71	6.00	6.23	2.00	2.45	.....	.....
Hubbard's High Potash Fertilizer 4-8-10	4.00	4.38	.....	8.35	8.00	8.03	10.00	10.67	.....	.....
Hubbard's Raw Knuckle Bone Flour	3.70	4.10	24.70	25.07	.....	15.61	.....	.....	.....	.....
Hubbard's 8-5-8 Top Dressing	8.00	8.03	.....	9.17	5.00	6.61	8.00	8.07	.....	.....
Red H Brand 3-12- 6	3.00	3.28	.....	12.30	12.00	12.04	6.00	6.85	.....	.....
Red H Brand 4- 8- 4 Fertilizer	4.00	4.32	.....	8.42	8.00	8.06	4.00	4.60	.....	.....
Red H Brand 4- 8- 7 Fertilizer	4.00	4.11	.....	8.66	8.00	8.42	7.00	**6.28**	.....	.....
Red H Brand 4- 8-10	4.00	4.33	.....	8.22	8.00	8.00	10.00	10.70	.....	.....
Red H Brand 5- 8- 7	5.00	5.17	.....	8.56	8.00	8.38	7.00	7.28	.....	.....
Red H Brand 7- 6- 6 Fertilizer	7.00	7.18	.....	6.34	6.00	6.21	6.00	6.85	.....	.....
Swift & Co. Fertilizer Works Baltimore, Md.										
Vigoro Complete Plant Food	4.00	4.17	.....	12.64	12.00	12.02	4.00	4.49	.....	.....